25, middle toe without claw 23.5 mm, weight 59.75 g, gonads small. It is now in the National Museums of Rhodesia in Bulawayo.

This is the first record of the American Pectoral Sandpiper from Botswana and the second collected specimen from southern Africa. It will be noted that all records of this species in Africa are of single birds, usually in company with other related waders. The only inland records are the specimens from Lake Naivasha and Toromoja and the sight record from Heany which Smithers *et al.* (1957: 19) doubt. In view of their distribution within the continent it would appear that birds breeding in eastern Siberia and in eastern North America may come to Africa and that they may do so more regularly than has been supposed. The species will, no doubt, be reported from other parts of Africa in due course.

We are obliged to Mr. R. Boulton, Director of the Atlantica Research Station near Salisbury in Rhodesia, for the loan of Ridgway (1919). He concurs in our identification.

References:
Editor. 1949. Points from letters. *Ostrich* 20: 96–97.
Middlemiss, E. 1965. Rare sandpiper at Rondevlei bird sanctuary. *Ostrich* 36: 147.
Ridgway, R. 1919. The birds of north and middle America. *Bull. U. S. Nat. Mus.* 50.
Smith, K. D. 1964. Nearctic waders in Morocco. *Ibis* 106: 530–531.
Smithers, R. H. N., Irwin, M. P. S. and Paterson, M. L. 1957. *A check list of the birds of Southern Rhodesia.* Salisbury: Rhodesian Ornithological Society.
Tree, A. J. 1966. Pectoral Sandpiper, *Calidris melanotus*, in Bathurst District, Eastern Cape. *Ostrich* 37: 195–196.
— 1971. Another Pectoral Sandpiper in Bathurst District, E. Cape. *Ostrich* 42: 80–81.
Williams, J. G. 1952. American Pectoral Sandpiper in Kenya Colony. *Ibis* 94: 538.
Witherby, H. F. Jourdain, F. C. R., Ticehurst, N. F. & Tucker, B. W. 1943. *The handbook of British birds* IV. London: H. F. & G. Witherby Ltd., London.

[At my instance, and with the agreement of P. R. Colston, a specimen of *Calidris melanotos* collected at Fort Simpson, North-West Territories, Canada, in September 1862 was donated from the University Museum of Zoology, Cambridge to the National Museum, Bulawayo. M. P. Stuart Irwin has duly compared it with the Botswana specimen discussed above, which he confirms is correctly identified, the wholly white shaft of the outermost primary in particular being diagnostic—Ed.]

Notes on the identification of eggs, egg mimicry and distributional history and the status of the form *serratus*, in the parasitic *Clamator* cuckoos

by C. J. O. Harrison

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Summary

The blue eggs of several *Clamator* species are very similar. In some cases two species are sympatric in distribution, and the collected eggs show an overlap in size and shell-weight. It is not possible to identify specifically these eggs with certainty and since it is also likely that field identification is fallible, information based on collected specimens should be used with caution.

The parasitic cuckoos of the genus *Clamator* have eggs which, over most of their range, mimic those of the normal host species in colour and pattern, showing parallel variation in some African localities. In southern Africa, however, eggs of *C. glandarius* and *C. j. serratus* do not resemble those of the

hosts, and it is likely that the species have moved into this region in evolutionarily recent times. The southern African form *serratus*, now treated as a race of *C. jacobinus*, differs from the latter in plumage, distribution, egg size, and in most instances egg-shell colour. It appears to have diverged to a point where it seems preferable to treat it as a separate species.

Introduction

The following notes result from an examination of the extensive cuckoo egg collection in the British Museum (Natural History), and the discussion is based mainly on this material.

Identification of *Clamator* eggs

Where species of *Clamator* cuckoos having similar plain blue eggs are sympatric in general range some doubts must arise concerning egg identification down to species level. The only certainly identified eggs of the parasitic cuckoos, unless laying has been witnessed, are those taken from the oviducts of shot birds. In other cases the collector must presumably rely on his own observations on the species apparently present in the locality, or on published data on egg size. Eggs are normally identified by the two dimensions of length and breadth, and in the case of cuckoo eggs shell-weight is often used since this will have been ascertained in order to help separate the eggs from those of the hosts. On the two dimensions the length is the more variable and the breadth the more conservative, the latter being presumably controlled to some extent by the relatively constant factor of oviduct diameter. Some data from eggs in the British Museum collection are as follows:—

C. coromandus. 300 eggs. Weight 380–757 mg. Breadth 20.0–24.6 mm (only eight below 22.0). No oviduct eggs.

C. jacobinus pica (India). 200 eggs. Weight 340–593 mg. Breadth 17.6–21.4 mm. Seven oviduct eggs. 426 mg, 18.5 mm; 447, 19.6; 430, 19.9; 548, 20.9; 437, 20.3; 245 (? incompletely formed), 19.4; 428, 18.2

C. jacobinus pica (Africa). 8 eggs. Weight 285–473 mg. Breadth 19.5–20.1 mm. One oviduct egg, 429, 19.9.

C. levaillantii. 10 eggs. Weight 469–558 mg. Breadth 20.0–20.9 mm, and one at 22.1. One oviduct egg, partly broken, –, 20.8.

If one examines the two Indian forms there is some evidence of size overlap. The vast majority of these eggs were taken by E. C. S. Baker in the zone of sympatry, in the same localities, at the same period of the year, from the same host species in some instances. Although his data gives no indication of doubt there seems no way in which he could have been certain of the species involved other than by extrapolating from an anticipated size.

The situation looks a little more satisfactory with regard to the two African birds; but the African and Indian *C. jacobinus* considered here are thought to be of the same race, are of similar size, and might be expected to lay eggs of similar size. Most of the eggs from India outside the range of *C. coromandus* are of the smaller nominate race of *C. jacobinus*. Thirty-nine such eggs have a range of 18.0–21.0 mm and an average breadth of 19.3 mm. However, both this and the range of oviduct egg sizes of Indian *C. jacobinus* overlap the complete size range of *C. levaillantii* in Africa. It seems improbable that the species adjusts its egg size to exactly fill the range below that of its larger competitor, and more likely that the identification of the eggs of *C. jacobinus* in the field may have been adjusted according to the anticipated size of the egg of the larger sympatric species. In the circumstances there must be some uncertainty as to the specific identification of the eggs of these birds, and allowance must be made for this in using any data drawn from them.

Mimicry of host's eggs and apparent evidence of earlier distribution

The eggs laid by the various species of *Clamator* cuckoos show relative consistency of colour and pattern, and a high degree of mimicry of the eggs of host species over most of their geographical range. The Great Spotted Cuckoo, *C. glandarius*, with a range through the Mediterranean region, Asia Minor and Africa south of the Sahara, is normally a brood-parasite on the Corvidae. Its eggs are a pale greenish blue, heavily spotted and speckled in shades of grey and brown, and showing little variability. These bear a close general resemblance to the eggs of corvid species, and have a particularly strong mimetic resemblance to those of the Magpie, *Pica pica*, which is the principal host of this cuckoo.

The Pied Cuckoo *C. jacobinus*, Stripe-breasted Cuckoo *C. levaillantii*, and Red-winged Crested Cuckoo *C. coromandus* are normally brood-parasites of the larger Timaliidae. *C. jacobinus* occurs in Africa and India; *C. levaillantii* occurs in Africa south of the Sahara and is extensively sympatric with the first; and *C. coromandus* occurs in south-east Asia and in northern India, showing some sympatry with *C. jacobinus*. *C. jacobinus* is a smaller bird, *C. levaillantii* a little larger, and *C. coromandus* is distinctly larger. The last two species and, over most of its range, *C. jacobinus*, lay immaculate blue eggs which resemble those of the timaliid host species so closely that they are normally separable only on shape, size, and shell-weight. In India and south-east Asia there is some variation in the colour and pattern of the eggs of *Garrulax* species which *C. coromandus* parasitizes. These may be pale blue or white, or may be sparsely marked with red. Possibly because of persistent variability within an area there appears to be no adaptation for special mimetic resemblance, and typical blue cuckoo eggs occur in these nests.

In tropical Africa the Brown Babbler *Turdoides plebeja* is a major host to both *C. jacobinus* and *C. levaillantii*. This host species usually lays an immaculate blue egg, but in part of Nigeria it shows a striking variation. Clutches from this region may be of a uniform light pink, quite unlike those found in any other avian species. They have been referred to by Serle (1939) and illustrated in Thomson (1964). In normal blue eggshells the pigment is present throughout the whole thickness of it (Harrison 1963). These pink eggs appear to have white shells with a superficial pink layer. Occasionally the two pigments are combined to produce variable grey or lilac tints. The British Museum (Natural History) has a clutch of grey eggs (reg. no. 1928.10.8.3–5) in addition to a pink clutch (1938.1.25.43–54), and Serle (*pers. comm.*) found eggs of pale mauve and grey-blue.

Serle also found two clutches of pink eggs each containing a pink egg of *C. levaillantii* (1–2) (numbers in parenthesis refer to data given below). The Museum has a clutch of pink eggs with a slight lilac tint containing a similar egg of *C. levaillantii* but with a slightly more buff tint (3), and also a clear pink egg of that cuckoo (4) and a lilac egg of *C. jacobinus* (5). A clutch of white eggs of *T. plebeja cinerea* from Uganda contains a white egg of *C. jacobinus* (6). From this it would appear that consistent and conspicuous variation of the host's eggs in these regions of Africa is matched by adaptive variation in the eggs of *Clamator* species to an extent that suggests an association of long standing. The close correlation of cuckoo and host egg colours in the known examples is of interest. One would have anticipated an occasional failure to match the colour. This correlation might be due, in part, to the relatively small sample.

In addition to these there are, however, in the Museum collection several

instances of blue eggs of *C. jacobinus* from East Africa which were found in nests of the White-vented Bulbul *Pycnonotus barbatus*, which has white eggs very heavily freckled with purplish-red spots and flecks. The total lack of resemblance suggests either a recent adoption of this host or a lack of response from host and/or predators relying on vision (Harrison 1968).

A similar situation exists in southern Africa. Here *C. glandarius* is present but in addition to parasitising *Corvus albus* with typical corvid eggs is also parasitic on the Cape Rook *C. capensis*, which has pale eggs with red spots and blotches, and on various starling species which have immaculate blue eggs or blue eggs with sparse red markings. The cuckoo shows no evidence of adaptation in egg colour to these other hosts, and its eggs are conspicuously different.

A very distinct form of the Pied Cuckoo, *C. jacobinus serratus*, previously regarded as a separate species, occurs in southern Africa. It lays consistently larger eggs than other races of *C. jacobinus* and these are always immaculate white. It parasitises not only *Pycnonotus barbatus* but other bulbuls including the Sombre Bulbul *Andropadus importunus*, which has white or buffish eggs with brown and grey spots, blotches or scribbles. It also parasitises the Fiscal Shrike *Lanius collaris*, with greenish, dark spotted eggs; and the Fiscal Flycatcher *Melaenornis silens*, which has greenish eggs heavily spotted with buff. Again there is no resemblance between eggs of cuckoo and host, although the pure white egg of the former might be adduced as evidence of a partial adaptation to hosts whose eggs have a mainly white or whitish ground colour.

In view of the wide range of host species involved in southern Africa one can hardly argue in favour of a general difference in host response or predation between this and other regions, and it is more reasonable to suppose that the lack of mimicry indicates an evolutionarily recent invasion of this region by both *C. glandarius* and *C. jacobinus*.

This is not in agreement with Friedmann's hypothesis (1964). He appears to have assumed that a white cuckoo's egg was the precursor of a blue egg which in turn gave way to patterned eggs, and that the presence of such colours in present-day species was a clue to their original phylogeny. He suggests that the genus originated in South Africa, spread to Central Africa and to south-east Asia where it produced the larger *coromandus* from which *glandarius* was derived, and spread back first to the Mediterranean and then to southern Africa.

It would seem equally reasonable to suppose that the ancestral form had an Afro-Asiatic distribution and during a period, or periods, of Pleistocene glaciation differentiated in glacial refuges to produce *coromandus*, probably in the south China region, *glandarius* in the Mediterranean region, and *jacobinus* and *levaillantii* somewhere in the North African, Arabian and Iranian regions. With subsequent climatic changes the fragmentation in the arid regions and the spread into southern Africa could have occurred. In this case the white egg of *C. j. serratus* could be a secondary derivation from a bird which, as the West African evidence shows, is capable of adapting its egg colour to that of its host over a period of time.

Data on abnormally coloured eggs

1. *C. levaillantii*. set 37/9. 25 × 20.1 mm, 452 mg. W. Serle. Kafanchen, Nigeria. 1937.
2. *C. levaillantii*. set 37/38. 24.7 × 20.0 mm, 475 mg. W. Serle. Kafanchen, Nigeria. 1937.

3. *C. levaillantii*. 1945.3.238. 24.4 × 20.8 mm, 490 mg. R. S. Shuel. Kano, Nigeria. 10 Sept. 1936.
4. *C. levaillantii*. 1938.12.2.1. 25.6 × 20.7 mm, 512 mg. J. B. Welman. Kaduna, Nigeria. 5 Aug. 1936.
5. *C. jacobinus*. 1964.1.1. 24.4 × 19.0 mm, –. J. G. H. Brotherton. Kaduna, Nigeria. March 1936.
6. *C. jacobinus*. 1962.19.12. 26.2 × 19.9 mm, 399 mg. B. G. Kinloch. Akokoro, Uganda. 2 April 1950.

The status of *serratus*

C. j. serratus of southern Africa is a very distinct form. Apart from a slightly longer tail its measurements are not significantly different as regards the normally measured dimensions. However, its eggs are consistantly larger than those of *C. j. pica*, thirty-three having a weight range of 332–723 mg and a breadth of 21–23.5 mm, being mostly larger than eggs of *C. levaillantii*. It is possible that the size difference might reflect a difference in body size not apparent from the conventional measurements. These larger eggs are always white in colour. This form differs in plumage colour from the typical *C. jacobinus*, the breast of which is pale, almost white, in colour; while *serratus* is dimorphic, being either pale grey or black on the underside. Its breeding distribution is in Africa south of the Zambesi; and it is a migrant, occurring in southern Africa in the breeding season between October and March, and wintering further north within the range of *C. j. pica*. North of the equator, the latter breeds at the opposite time of year, from March to October, and may move south into the range of *serratus* when not breeding, but more southerly birds breed at the same period as *serratus*. There is a single instance, from Strathmore Ranch, Southern Rhodesia, on 27th Feb. 1922, of two eggs which appeared to be those of *C. j. pica* occurring in the breeding range of *serratus*. The eggs were blue in colour, weighed 331 and 333 mg and measured 19.5 and 19.9 mm (B. M. reg. no. 1962.9.13), and were found in a *Turdoides jardinei* nest. White cuckoo eggs from further north than the usual range of *serratus* appear to be those of *C. j. pica*.

This population therefore differs from *C. jacobinus* in plumage colour; and its eggs differ from those of *jacobinus* in size and colour. A reference to a loud piping call recorded mainly in southern Africa (Mackworth-Praed & Grant 1952) may refer to some voice difference, although there are no further data on this. The original reason for making this form a race of *C. jacobinus* appears to have been the similarity in size and the fact that birds of each form appeared in the range of the other (Mackworth-Praed & Grant 1937). Although it is obviously a species pair with *C. jacobinus*, and of the same origin, it appears to have separated and diverged to a point where it has achieved full isolation, and unless there is some evidence to the contrary it seems preferable to treat it as a separate species, *C. serratus*.

Acknowledgements

I am grateful to Dr. W. Serle for data on his West African eggs of *Turdoides plebeja* and *Clamator levaillantii*; and to Captain C. R. S. Pitman for help and information.

References:

Friedmann, H. 1964. Evolutionary trends in the avian genus *Clamator*. *Smiths. Misc. Coll'ns.* 146(4) (Publ. 5432).

Harrison, C. J. O. 1963. Eggshell pigmentation in the Jacobin Cuckoo, *Clamator jacobinus* (Bodd). *Bull. Brit. Orn. Cl.* 83: 258–259.

Harrison, C. J. O. 1968. Egg mimicry in British Cuckoos. *Bird Study* 15: 22–28.
Mackworth-Praed, C. W. & Grant, C. H. B. 1937. Systematic notes on East African birds. *Ibis* (14) 1: 402–406.
— 1952. *African handbook of birds*, Series I, Vol. 1. London: Longmans.
Serle, W. 1939. Field observations on some northern Nigerian birds. *Ibis* (14) 3: 654–699.
Thomson, A. L., Ed. 1964. *A new dictionary of birds*. London: Nelson.

The Slatey Egret *Egretta vinaceigula* is a good species

by C. W. Benson, R. K. Brooke & M. P. Stuart Irwin

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At the outset we should explain that we consider that the most suitable English name for this species is as above. Mackworth-Praed & Grant (1962), for instance, use 'Brown-throated Heron'. But according to C. J. Vernon, a paper by whom on this species follows the present one*, in life it appears much more slate coloured than the Black Egret *Egretta ardesiaca* (Wagler), of which it has sometimes been placed as a colour phase. Also, from museum skins, it might be inferred that the vinous throat is the most diagnostic feature, but in life it is usually difficult to see, since as often as not, according to Vernon, the bird is walking away from the observer.

The Slatey Egret *Egretta vinaceigula* (not *E. vinaceigularis* as in Mackworth-Praed & Grant 1962) was described by Sharpe (*Bull. Brit. Orn. Cl.* 5: 13) in 1895 on two male specimens collected by Thomas Ayres at Potchefstroom in the Transvaal and which are now in the British Museum (Natural History). It was not recorded again for many years until R. H. N. Smithers collected another male at Kabuta in the Caprivi Strip on 7 July 1958 (Smithers 1964). Doubt has arisen whether the Slatey Egret is a species or a variant (mutant or colour phase) of the Black Egret *E. ardesiaca* (Wagler). Roberts (1940) treated it as a straight synonym of the Black Egret. Bock (1956) in his review of the herons did not see material but placed it as a colour phase of the Black Egret on the grounds that Sharpe's original description did not indicate any other difference from the Black Egret beside the rufous or, more correctly, vinous throat. Bock's view has been followed by the S.A.O.S. List Committee and by McLachlan & Liversidge (1957, 1970) but not by Clancey (1965) or by Mackworth-Praed & Grant (1962). We have received field reports which suggest that there is a difference in ecology between the two forms and have therefore re-examined the specimens and are satisfied that the Slatey Egret is a good species.

Sharpe originally placed *vinaceigula* with *ardesiaca* in the genus *Melanophoyx* which he erected in 1894 (*Bull. Brit. Orn. Cl.* 3: 38) on the grounds that it differed from the new world *Florida* Baird 1858 by having elongated plumes on the crest and breast and with the back plumes not reaching beyond the tail. He regarded it as similar to *Florida* in that the bill or culmen was not as long as the middle toe including the claw. Bock (1956) placed both genera in *Hydranassa* Baird 1858 on the ground that the scapular plumes were lanceolate to filamentous, not aigretted. He noted that the Reef Heron *E. sacra* (Gmelin) of Asia and Australasia had both types of scapular plumes. He also mentioned a wild hybrid between the Snowy Egret *E. thula* (Molina) and the Little Blue Heron *E. caerulea* (L.) reported by Sprunt (1954). We follow White (1965) and Clancey (1965) in placing all these herons in *Egretta*

* Vernon's paper will be in the next number—Ed.